

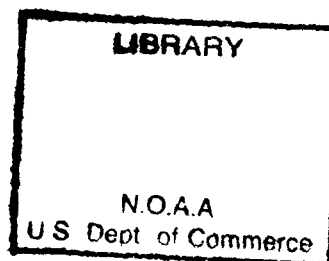


THE ARAB REPUBLIC OF EGYPT

ANNUAL METEOROLOGICAL REPORT

1972

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THE EGYPTIAN METEOROLOGICAL AUTHORITY

CAIRO

National Oceanic and Atmospheric Administration

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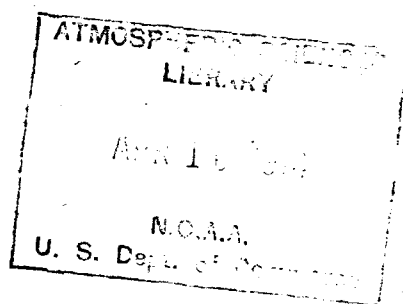
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CAIRO

PUBLICATIONS OF THE METEOROLOGICAL AUTHORITY OF THE ARAB REPUBLIC OF EGYPT — CAIRO

In fulfilment of its duties, the Meteorological Authority of Egypt issues several reports and publications on weather, climate and agrometeorology. The principal publications are described on this page.

Orders for publications should be addressed to :

"Chairman of the Board of Directors, Meteorological Authority, Kubri-el-Qubbeh — CAIRO".

THE MONTHLY WEATHER REPORT

First issued in 1909, the Monthly Weather Report served to give a brief summary of the weather conditions that prevailed over Egypt during the month, with a table showing the mean values for few meteorological elements and their deviations from the normal values. From 1954 to 1957 this report was in a rapid state of development and extension resulting into a voluminous report on January 1958 giving surface, upper air, and agro-meteorological data for Egypt.

As from January 1964, the Monthly Weather Report was pressed to give climatological data for a representative selection of synoptic stations.

THE AGRO-METEOROLOGICAL ABRIDGED MONTHLY REPORT

Gives a review of weather experienced in the agro-meteorological stations of Egypt as well as monthly values of certain elements.

THE ANNUAL REPORT

This report gives annual values and statistics for the various meteorological elements, together with a summary of the weather conditions that prevailed during all months of the year.

CLIMATOLOGICAL NORMALS FOR EGYPT

A voluminous edition was issued in March 1968 which brings normals and mean values up till 1960.

METEOROLOGICAL RESEARCH BULLETIN

First issued in January 1969 on a bi-annual basis. It includes research works carried out by members of staff of "The Meteorological Institute for Research and Training" and the Operational Divisions of the Meteorological Authority.

TECHNICAL NOTES

As from October 1970, the Meteorological Authority started to issue a new series of publications in the form of Technical Notes (non periodical) on subjects related to studies and applications of meteorology in different fields for the benefit of personnel working in these fields.

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FOREWORD

The "Annual Meteorological Report" for Egypt was issued regularly since the year 1900 by the Survey Department at Cairo. The Annual report of the year 1900 contained the daily, monthly and annual values of different meteorological elements at Abbasiya (Cairo) and other few climatological stations in Egypt and Sudan.

With the closing of Abbasiya Observatory as the Principal Meteorological Station in the year 1904 and replacing it by Helwan Observatory, it had been decided starting from the Annual Meteorological Report of 1904 to separate the Annual Meteorological Report into two independent parts, the first of which was dealing with the whole work of Helwan Observatory, while the second part included the daily, monthly and annual values of different meteorological elements at selected climatological and rainfall stations together with the River data.

Starting from the issue of 1941 the Annual Meteorological Report contained no more "daily values" but only monthly and annual values.

As from the issue of 1958 the Annual Meteorological Report took a new form. It started with a general annual review of weather together with twelve monthly summaries of weather conditions in Egypt. In addition, it included a new set of tables giving more detailed surface and upper air climatological data for selected stations. The annual review of Agro-Meteorological Station at Giza ; the monthly and the annual

values of routine observations made at the fields of the station were also included in the Annual Report. This annual review gave a brief summary of the characteristic features of the different meteorological and micro meteorological elements of the year ; more weight was given in this review to elements which are of interest to agriculturists. Moreover, the Annual Meteorological Report specified the different climatic districts in Egypt. It also contained explanatory notes about methods of observations of different meteorological elements ; instruments used in these observations, their exposure and methods of deriving daily, monthly and annual mean values and frequencies of different elements.

As from 1960, tables appearing in the Annual Meteorological Report have been totally revised and some new tables have been introduced to include more detailed climatological data.

As from 1964, the Annual Meteorological Report was again totally revised. The number of meteorological stations appearing in the Report have been concentrated in the main synoptic stations working mostly continuously 24 hours. In addition, climatological data included in the Report will be confined to the annual mean values, annual totals, annual frequencies and annual absolute values. More specific climatological data have to be requested from the Meteorological Authority.

INTRODUCTION AND EXPLANATION OF THE TABLES

For the purpose of this Annual Meteorological Report, the Arab Republic of Egypt is divided into six climatic districts as follows :

Number	District	Number	District
I	Mediterranean Area	IV	Upper Egypt
II	Lower Egypt	V	Western Desert
III	Cairo Area	VI	Red Sea Area

The data included in Tables A1, A2, A3, A4 and A5, are based on surface observations made at a representative selection of the basic network of synoptic stations. The data included in Tables B1, B2, B3 are based on upper air observations. The data included in Tables C1, C2, C3, C4 & C5, are based on observations taken at the Agro-Meteorological stations at Bahtim, Tahrir, Mersa Matruh and Kharga. The observation fields at Bahtim, Tahrir, Mersa Matruh and Kharga are considered for the moment as dry and bare fields. At Kharga Oasis, the observation field is of the size of about 4000—6000 square metres.

The soil characteristics of these fields are :

	M. MATRUH	TAHRIR	BAHTIM	KHARGA
Top soil type . .	Not available at present	Pure sand	Permeable day	Sandy loam granular Not-compact
Top soil depth .	„	More than 3 metres	More than 1.5 metre	20 cms.
Sub soil type . .	„	Pure sand	Clay loam and loam	Platy clay non-compact
Slope of ground and its direction .	„	$\frac{1}{2}\%$ towards East & North	Flat (0-0.3%)	Flat (0-0.3%)
Level of Water table	„	More than 5 metres	1.0-1.5 m. approximat ely	More than 5 metres

Except for the wind speed which is expressed in knots, the metric units are used throughout this report and are as follows :

- The atmospheric pressure is expressed in millibars (one millibar = 1000 dynes per square centimetre = The pressure due to 0.7501 millimetre of mercury at 0°C at latitude 45°).
- Air and soil temperatures in degrees celsius (°C).
- Relative humidity (%).
- Rainfall in millimetres.
- Duration of bright sunshine in hours.
- Sky cover in oktas.
- Evaporation in millimetres.
- Altitude of pressure surface in geopotential metres.
- Mean wind speed of the whole day, and of the day-time and the night-time intervals in metres per second.
- (Solar+Sky) radiation in gram-calories per centimetre square.
- Vapour Pressure in millimetres.

EXPLANATORY NOTES ON TABLES

SURFACE DATA

TABLE A 1.—Annual mean daily values of the Atmospheric Pressure, Air Temperature, Relative Humidity, Piche Evaporation and Total Bright Sunshine Duration.

This table gives the following data :

- The annual mean daily values of the M.S.L. Pressure and their deviations from the corresponding normal values.
- The annual mean values of maximum air temperature (A), minimum air temperature (B) and $\frac{A+B}{2}$ and their deviations from their corresponding normal values.
- The annual mean daily values of dry bulb temperature, wet bulb temperature and relative humidity and their deviations from their corresponding normal values.
- The total actual and the total possible durations of bright sunshine during the year; the percentage of the total actual with respect to the possible duration.
- The annual mean daily values of Piche Evaporation.

The annual mean daily values of the atmospheric pressure, air temperature, relative humidity & Piche evaporation are the arithmetic means of the corresponding monthly mean daily values during the year.

The monthly mean daily value of the atmospheric pressure corrected to Mean Sea Level (M.S.L.) is the arithmetic mean over the month of the corresponding daily hourly values or of the daily observations taken at the 8 synoptic hours (00, 03, 06, 09, 12, 15, 18 & 21 U.T.). The atmospheric pressure is measured by mercury barometers installed indoors. The M.S.L. Pressure is the barometer reading corrected for the height of the barometer cistern above or below the Mean Sea Level at the station. Corrections for index, temperature and latitude have been applied to the barometer readings before reduction to M.S.L. In case of stations which do not take some of these synoptic observations, the pressure for these hours is computed from the records of barographs placed indoors at the stations.

The monthly mean values of the maximum (A) and of the minimum (B) air temperatures are the arithmetic means of their corresponding daily values over the month. The maximum (mercury) and the minimum (alcohol) thermometers are freely exposed in the louvred screens with their bulbs at a height of 160 to 170 centimetres above the ground.

The monthly mean values of $\frac{A+B}{2}$, are computed from their corresponding daily calculated values over the month.

The monthly mean daily values of the dry and of the wet bulb air temperatures are the arithmetic means over the month of their corresponding daily hourly values or of their corresponding values at the 8 synoptic hours (00, 03, 06, 09, 12, 15, 18 & 21 U.T.). The dry and wet bulb thermometers used are of the mercury type and freely exposed in sloping double roofed louvred screens with their bulbs at a height 140-150 centimetres above the ground. In case of stations which do not take observations at some synoptic hours, values of the dry and wet bulb temperature for these synoptic hours are extracted from the records of recording dry & wet thermographs placed in the louvred screens at the stations.

The monthly mean daily values of the relative humidity are derived from the mean daily values during the month of the dry and wet bulb air temperatures using Jelinek's Psychrometer Tafeln (Leibsig 1911). The mean daily values of the dry and wet bulb air temperatures are derived as in the last paragraph.

The monthly mean daily values of Piche evaporation are the arithmetic means over the month of its daily values. Evaporation measurements are taken once daily at 0600 U.T. and give the evaporation for the previous 24 hours. The evaporation readings are measured by a Piche tube freely exposed in sloping double roofed louvred screens, the evaporation disc has an effective area of 10.1 centimetre square, white in colour and at a height of 140—150 centimetres above the ground.

The annual value of the actual duration and of the possible duration of bright sunshine is the sum of their corresponding monthly values during the year. In calculating the possible duration of sunshine for a given day, the period of cut off for that day caused by obstacles such as mountains, are eliminated from the possible duration with an ideal flat horizon. In case of stations where the record of a day or more is missing, the total actual duration is given between brackets and a note is added at the end of the table giving the actual number of records (days) used in summing up this total actual. In such cases the corresponding total possible duration is also given in brackets and it is the sum of the annual possible duration of the days of the available records. The duration of bright sunshine is measured by the Campbell-Stokes sunshine recorders which are suitably exposed.

TABLE A 2.—Maximum and Minimum Air Temperatures.

This table gives the following data :

— The extreme values of the maximum and of the minimum air temperatures observed during the year and their dates of occurrences.

— The number of days during the year with maximum air temperatures above and with minimum air temperatures below, specified limits.

— The annual mean daily values of the grass minimum air temperatures and their deviations from the corresponding normal values.

Higher and lower limits of both maximum and minimum air temperatures during the year and their corresponding dates of occurrences are extracted from the daily readings of maximum (mercury) and minimum (alcohol) thermometers. These are included for actual occurrences up to three (last three dates) ; when exceeding three, the symbol* is added beside the last three dates.

The number of days during the year with maximum air temperatures above 25°C, 30°C, 35°C, 40°C & 45°C and with minimum air temperatures below 10°C, 5°C, 0°C & — 5°C are included also in this table under separate columns.

The types and exposure of the maximum and of the minimum thermometers are as indicated in notes on table A 1.

The annual mean values of grass minimum temperatures are the arithmetic means over the year of the corresponding monthly mean values. The monthly mean values are the arithmetic means over the month of their corresponding daily values. The grass minimum temperature is measured by an ordinary minimum (alcohol) thermometer suitably exposed in the open air at the station field on special stand with its bulb at a height of 5 centimetres above ground just touching the grass tops if there is any. Grass minimum thermometer readings are taken daily on a routine base at 0600 U.T.

TABLE A 3.—Sky Cover and Rainfall

This table gives the following data :

- The annual mean values of the total sky cover at the principal synoptic hours of observations and of the daily total sky cover.
- The total amount of rainfall during the year and its deviation from the corresponding normal value.
- The maximum amount of rainfall in one day and its date of occurrence.
- The number of days with amounts of rainfall reaching or exceeding specified limits.

The annual mean value of the total sky cover at the principal synoptic hours (00, 06, 12 & 18 U.T.) and of the daily total sky cover are the arithmetic means over the year of the corresponding monthly mean values. The monthly mean values of the total sky cover at the principal hours are computed from their corresponding daily routine values observed during the month. The monthly mean values of the daily total sky cover are the arithmetic means over the month of the daily hourly values or of the daily observations taken at the 8 synoptic hours (00, 03, 06, 09, 12, 15, 18 & 21 U.T.). Sky cover is in octas.

The total annual rainfall is the sum of the total monthly rainfall during the year. The total monthly rainfall is the sum of the daily rainfall during the month. The maximum daily rainfall and the number of days with rain < 0.1 and equal or more than 0.1, 1, 5, 10, 25 & 50 mms. are extracted from the routine daily rainfall totals during the year. The rainfall for a given day is the amount of rain which has fallen during the 24 hours commencing at 0600 U.T. of that day ; when the amount of rain which has fallen is not large enough to be measured (less than 0.1 mm.) the term «Trace» is entered as (Tr.). The amount of rainfall measured includes the water equivalent of the rain water which has frozen after falling and the water equivalent of solid precipitation such as hail if any. Dates of maximum rain in 24 hours are included for actual occurrences up to three (last three dates) ; when exceeding three, the symbol * is added besides the last three dates.

The amount of rainfall is normally measured by ordinary rain gauges. Some selected stations are also equipped with a recording type of rain gauge. The rim of both types of rain gauges are at a height of 90—100 cms above the ground.

TABLE A 4.—Annual Frequency of Occurrence of Miscellaneous Weather Phenomena.

This table gives the number of days of occurrence of rain, snow, ice pellets, hail, frost, thunderstorm, mist, fog, haze, thick haze, dust or sandrising, dust or sandstorm, gale, clear sky & cloudy sky. Except for rain (see notes on table A 3) the days of occurrence of these weather phenomena are those days during which the phenomenon has occurred at any time between 2200 and 2200 U.T. for stations working 24 hours, but for stations working less, this table gives the annual frequency of occurrence of these phenomena during hours of observations only.

In compiling this table, the terminology and definitions of these different weather phenomena are as follows.

- A day of rain is the day during which the total amount of rainfall is 0.1 millimetre or more.
- A day of snow is the day during which snow or snow flakes or snow showers is or are observed even if it is or (they are) so small in quantity as to yield no measurable amounts of precipitation in the rain-gauge.

— A day of ice pellets is the day during which ice pellets are observed even if they are so small in quantity as to yield no measurable amounts of precipitation in the rain-gauge.

— A day of hail is the day during which either one or more of the following types of precipitation is or are observed even if they are so small in quantity as to yield no measurable precipitation in the rain-gauge :

- Soft hail
- Small hail
- Hail stone

— A day of frost is the day during which frost is observed at the station.

— A day of thunderstorm is the day during which thunder is heard at the station whether lightning is seen or not. A day on which lightning is seen but thunder is not heard at the station is not counted as a day of thunderstorm.

— A day of mist is the day during which the surface horizontal visibility at the station has deteriorated and became equal to or greater than 1000 metres due to mist.

— A day of fog is the day during which the surface horizontal visibility at the station has deteriorated and fell below 1000 metres due to fog.

— A day of haze is the day during which the horizontal visibility at the station has deteriorated and became equal to or greater than 1000 metres due to haze

— A day of thick haze is the day during which the horizontal visibility at the station has deteriorated and fell below 1000 metres due to thick haze.

— A day of dust or sandrising is the day during which the horizontal visibility at the station has deteriorated and became equal to or greater than 1000 metres due to dust or sandrising.

— A day of dust or sandstorm is the day during which the horizontal visibility at the station has deteriorated and fell below 1000 metres due to dust or sandstorms.

— A day of gale is the day during which the mean surface wind speed reached or exceeded 34 knots at the station for at least 10 minutes.

— A day of clear sky is the day on which the mean cloud amount at the station is less than $\frac{2}{8}$.

— A day of cloudy sky is the day on which the mean cloud amount at the station is $\frac{6}{8}$ or more.

As regards the last two items above, the mean cloud amount for a day is the mean of the 24 hours, the 8 synoptic hours or the 4 main synoptic hours of cloud observations according to the number of the routine observations taken at the station.

TABLE A 5.—Annual number in hours of occurrences of concurrent surface wind speed and direction recorded within specified ranges.

This table gives the annual number in hours of the following :

- Calm winds,
- variable winds,
- unrecorded winds,
- simultaneous occurrences of surface wind satisfying the specified ranges of speed and direction,
- surface wind blowing from specified ranges of direction irrespective of their speed,
- surface wind satisfying specified ranges of speed irrespective of their direction.

The annual numbers in hours of all elements included in this table are the sum of the corresponding monthly values during the year.

The elements used in preparing this table are the mean hourly values of the surface wind speed and the corresponding mean hourly values of direction taken from the daily records of the surface wind instruments installed at the station. These mean hourly values are extracted for every hour of each day of the year and they refer to a period of 60 minutes centred at the hour.

The number in hours of occurrences of the surface wind falling within the ranges of speed and direction indicated in the table is the number of cases when the mean hourly values of the surface wind as defined have satisfied these ranges.

The number in hours of "variable" winds is the number of cases when the surface wind showed no definite direction over the period of the 60 minutes centred at the hour or when the wind vane was sticking over that period due to the lightness of the wind and not responding to the variation in wind direction ; in such cases the mean wind speed over this period is normally less than 5 knots. The number in hours of "calm" winds is the number of cases where the surface wind has a mean speed of less than one knot over that period, whatever the mean wind direction over the same period is. The number in hours during which the recording instrument failed to record over the whole year is given under a separate column.

The instruments used for recording the surface wind are of the Dines Pressure Tube Anemograph.

This table follows the general lines of Model B of chapter 12 part IV of the WMO Technical Regulations 1959. The ranges of wind speed are (1-10), (11-27), (28-47) knots and 48 knots or more ; the ranges for wind direction are twelve ranges of 30° each, beginning with the range (345°-014°) as being the true north.

UPPER AIR DATA

TABLE B 1.—Annual climatological data of pressure, temperature and dew point at the surface of the station, the standard and the selected pressure surfaces.

The routine upper air observations are taken at 0000 & 1200 UT, a separate table of this type is prepared for each hour.

This table follows the general lines recommended by the Commission for Climatology of the World Meteorological Organisation REC. 34 (CCL. -1), it gives the following data for the hour of observation indicated at the table :

— The number of cases (N) the height of each of the pressure surfaces indicated in the table has been attained during the year, and the number of cases the temperature and dew point at these pressure surfaces have been observed.

— The annual mean values of the atmospheric pressure corrected to the ground level of the station and its highest and lowest values during the year.

— The annual mean values of the air temperature at the surface, the highest and lowest values.

- The annual mean values of dew point at the surface.
- The annual mean, the highest and the lowest values of the altitude of each of the pressure surfaces.
- The annual mean, the highest and the lowest values of air temperature at each of the pressure surfaces.
- The annual mean value of dew point at each of the pressure surfaces.

Mean annual values are computed as the arithmetic mean of the twelve monthly mean values.

The monthly mean values are computed as the arithmetic mean of all daily values. Whenever, it is not possible to obtain a complete set of daily values, a useful monthly mean value may be obtained as the mean of available values, taking in consideration ; (a) number of missing observations not more than 10, and (b) there in no continuous period of 5 days without an assigned value.

The instruments used are of the radiosonde modulating frequency recording type ; no corrections for radiation are applied.

The altitudes are given in geopotential metres above mean sea level, temperatures and dew points in degrees celsius.(°C).

TABLE B 2.—Annual mean and extreme values of the freezing level and the first tropopause ; the highest wind speed in the upper air.

The routine upper air observations are taken at 0000 & 1200 U.T ; This table is based on wind observations taken by the SCR — 653 or the Metox radiotheodolites working simultaneously with the radiosonde observations. The types of radiosonde instruments used are given in notes to table B.

This table gives the following data for each hour of observation :

- The annual mean values of the altitude, pressure and dew point of the freezing level together with the number of observations (N) taken during the year for each element ; the altitudes and months of occurrence, pressures and dew points of the highest and lowest freezing levels observed during the year.
- The annual mean values of altitude, pressure and temperature of the first tropopause together with the number of observations taken during the year for each element, the altitudes and months of occurrences, pressures and temperatures of the highest and lowest first tropopauses observed during the year.
- The direction and speed of the highest wind speed, the altitude, month of occurrence and pressure at which this speed is observed.

The annual mean values of the altitudes of the freezing level and of the first tropopause, and the annual mean values of the pressure and of the dew point or temperature at each of these levels are the arithmetic means of the corresponding monthly mean values, and the monthly mean values are the arithmetic means of the corresponding daily values. The first tropause is determined in accordance with the definition adopted by the Executive Committee of the World Meteorological Organization Resolution 21 (EC-IX).

Altitudes are given in geopotential metres above mean sea level, temperatures and dew points in degrees celsius, wind direction in degrees east of the true north on the scale (000-360°) and wind speed in Knots.

Table B 3 — Annual Frequency of Occurrences of Wind Direction within Specified Ranges and The Mean Scalar Wind Speed at The Surface of The Station, The Standard and Selected Pressure Surfaces.

The routine upper air observations are taken at 0000 and 1200 U.T. A separate table of this type is used for each station.

This table, as in the case of table B 1, follows the genral lines recommended by the Commission for Climatology of the World Meteorological Organisation Rec 34 (CCL-1) ; the ranges of wind direction used are twelve ranges of 30° each beginning with the range (345° — 014°) as being the true north. This table gives for each hour of observation the following data of wind analysis at the surface, standard pressure surfaces and a number of selected pressure surfaces.

- The number of cases (N) the wind has been observed from the specified ranges of direction.
- The mean scalar speeds (ffm) of winds blowing from the specified ranges of wind direction.
- The number of cases of calm winds.
- The total number of cases (TN) the wind has been observed during the year.
- The mean scalar speeds of winds blowing from all directions.

The mean scalar wind speed(ffm) of winds blowing from each range of direction at a given pressure surface is the arithmetic mean of the ocrresponding monthly mean values of wind speeds. The term "Calm" is used to denote wind speed of less than one knot.

AGRO-METEOROLOGICAL DATA

Annual Review of Agro-Meteorological Stations.

The annual review includes abridged and summarized report on the characteristic features of the different meteorological and micro-meteorological elements. More weight is given in this review to those elements which are of interest to agriculturists.

TABLE C1.—Annual Mean Air Temperature at 1½ metres above Ground

This table gives the following data :

- The annual mean values of the maximum and of the minimum air temperatures.
- Tha annual mean values of the day, the night time and the day time of air temperatures
- The annual mean values of the duration of air temperatures above specified values.

The annual mean values of the maximum, minimum, night-time mean, day-time mean and mean of day of air temperatures are the arithmetic means of its monthly mean values. The monthly mean values of these elements are the arithmetic means of the mean daily values. The mean air temperature of a day is the mean of the eight values of the dry bulb temperatures occuring at each of the Principal and secondary observation hours, the values at 0000, 0300 & 2100 U.T. being extracted from the records of the dry bulb thermometer of a mercury in steel hygrograph except at Mersa Matruh and Kharga where they are obtained from visual readings.

The night-time mean temperature of a day is the mean temperature for the period from sunset of the previous day to sunrise of the same day. The day-time mean temperature refers to the preiod from sunrise to sunset of the same day. Both night-time and day-time mean temperatures are computed from empirical formulae, which may vary from month to month but are common for all centres. These formulae were found by trial comparison with true means of the year 1966. The errors were never permitted to reach a whole degree; and usually stayed aequal to or lower than 0.5°C.

The duration of air temperatures above a specified limit of temperature is obtained graphically from the temperature recording charts, daily to the nearest whole hour.

The maximum (mercury), the minimum (alcohol) and the dry bulb (mercury ventilated) thermometers are freely exposed in louvered Stevenson screens of the Egyptian type with their bulbs at a height of 190 - 195 centimetres above ground for the maximum and minimum thermometers, and 170 cms approximately for the dry bulb thermometer ; the recording thermometer used is of the bi-metallic type and is exposed in a similar screen ; the height of the bi-metallic piece is 165 centimetres approximately above the ground.

TABLE C 2.—Annual Extreme values of Maximum and Minimum air temperatures at $1\frac{1}{2}$ metres above ground, Absolute Minimum air temperature at 5 cms. above ground in different fields.

The extreme values (highest and lowest) of maximum and minimum air temperatures at $1\frac{1}{2}$ metres above ground, and the absolute values (lowest) of minimum air temperatures at 5 cms. above ground in dry fields are extracted from their corresponding daily routine values. Dates of occurrences are included in separate columns beside the corresponding extreme values.

The thermometers used for minimum air temperature at 5 cm. above ground are of the ordinary minimum type (alcohol) with the bulbs screened with small separate screens of horizontal 5 cm. length and 2 cm. diameter metal tubing painted white outside and black inside, and centered on the thermometer bulbs.

TABLE C 3.—Annual values of (Solar + sky) Radiation, Duration of bright sunshine, Relative humidity, Vapour pressure at $1\frac{1}{2}$ metres above ground, Evaporation and Rainfall.

This table gives the following data :

- The annual mean values of the (solar + sky) radiation.
- The annual total actual and total possible durations of bright sunshine, the percentage of the total actual with respect to the total possible duration.
- The annual mean of the day of relative humidity, the mean of relative humidity at 1200 U.T. and the lowest value of relative humidity during the year.
- The annual mean of the day of vapour pressure and the vapour pressure at 1200 U.T., the highest and lowest values of vapour pressure during the year.
- The annual mean values of the evaporation taken by the Piche tube and by class "A" evaporation pan.
- The annual total rainfall, and the maximum rainfall in one day during the year.

The annual mean value of the (solar + sky) radiation is the arithmetic mean of the monthly mean values. The monthly mean value is the arithmetic mean of the daily values. The (solar + sky) radiation is obtained, daily from the records of a Robitzsch actinograph ; the Robitzsch values at Bahtim and Tahrir are regularly compared with the records of an Eppley pyrliometer. The sensitive elements of the Robitzsch actinograph and of the Eppley pyrliometer are at 100 cms. approximately above the ground.

The annual value of the total actual and total possible duration of bright sunshine is the sum of the corresponding daily values during the year. The types of instruments used for the measurement of the duration of bright sunshine, their exposure and the calculation of the total possible duration values are as given in notes on table A1.

The annual mean relative humidity of the day and at 1200 U.T., mean vapour pressure of the day and at 1200 U.T. and mean evaporation are the arithmetic means of the corresponding monthly mean values.

The relative humidity and vapour pressure values at a certain hour are derived from the readings of ventilated dry and wet bulb mercury thermometers freely exposed in the screens using the Aspirations Psychrometer Tafeln of the Deutschen Wetterdienst 1955. The height of the bulbs is 170 cms approximately above the ground.

The mean relative humidity or vapour pressure for a given day is obtained from the eight principal and secondary observation values which are extracted from the readings of the dry and wet bulb thermometers, the values at 0000, 0300, and 2100 U.T. being extracted from the records of the mercury in steel hygrograph except at Kharga and M. Matruh where these values are obtained from visual readings of the dry and wet bulb thermometers.

The monthly mean values of the relative humidity & vapour pressure are the arithmetic means of the corresponding mean daily values during the month. The lowest value of the relative humidity and its date of occurrence are obtained from the records of a hair hygrograph exposed in the screen, the height of the hair is 170 centimeters approximately above the ground.

The absolute maximum and minimum values of vapour pressure during the year are extracted from the values of the eight principal and secondary observations.

Evaporation measurements are taken once daily at 0600 U.T. from a Piche tube and also a class "A" evaporation pan and give the evaporation for the previous 24 hours. The Piche tube is installed in the screen with the dry and wet bulb, maximum and minimum thermometers; the colour and effective area of the evaporation disc are as given in the notes on table A1. The class "A" evaporation pan is of the type recommended by the Commission of Instruments and Methods of Observation of the World Meteorological Organization Rec 42 (CIMO-56); it is of a cylindrical shape, 25.4 centimeters deep, 120.6 centimeters in diameter (inside dimensions). The pans, except at Bahtim, are freely exposed in the open air in the dry field, its rim at a height of 41 cms. above ground, far from obstacles such as buildings or trees. At Bahtim the pan is protected from animals and birds by a cylindrical cover of the same diameter as the pan and 30 cm height, made of metal wire mesh of one cm. side. Reduction of evaporation by 11%, established by systematic study is being allowed for in the data published.

The types of instruments used for measuring the amount of rainfall, their exposure and the evaluations of these amounts are given in the notes on table A 3.

TABLE C 4.—Extreme Soil Temperature at Different Depths in Different Fields.

The highest and lowest values of soil temperatures at the selected depths are extracted from their corresponding daily routine values.

The soil temperature readings are taken in the dry fields at the specified depths ranging from 2 cms to 300 cms as indicated in the table. These readings are taken regularly during the period from 0600 to 1800 U.T. according to the following schedule, except at Kharga where the observations are as appropriate but extend in the period between 1800 and 0600 U.T.

- at 0600 U.T. and every three hours for the 2, 5 and 10 cms depths.
- at 0600 U.T. and every six hours for the 20 and 50 cms depths.
- at 1200 U.T. for the 100 and 200 cms. depths.
- at 0900 U.T. once every 3 days for the 300 cms depth.

The thermometers used are of the Fuess or the Fridrich type.

TABLE C 5.—Surface Wind

This table gives the following data :

— The annual mean of the day, the night-time and the day-time of wind speeds.

— The annual number of days with surface wind speed at 10 metres reaching or exceeding specified limits for at least 5 minutes ; the highest gust recorded during the year and its date of occurrence.

The annual daily mean, the night-time mean and the day-time mean of the surface wind speeds are the arithmetic means of monthly mean values. The monthly mean values of these elements are the arithmetic means of the mean daily values. The mean wind speed of the day is the mean for the period of 24 hours from 1800 U.T. of the previous day. The night-time mean wind speed is calculated as the mean for the period 1800 U.T. of the previous day to 0600 U.T. of that day. The day-time mean is similarly computed for the period 0600 U.T. to 1800 U.T. of the same day.

The type of the wind instrument used is of the run counter of the Lambrecht type, the cups of which are at $1\frac{1}{2}$ metres above the ground.

The annual number of days with surface wind speed reaching or exceeding specified values of velocities (10, 15, 20, 25, 30, 35 & 40 Knots) for at least 5 minutes at any time between 2200 & 2200 U.T. irrespective of its direction are extracted from the daily routine analysis of the surface wind records during the whole year. The daily records of the Dine Pressure Tube Anemograph are used. The highest gust refers to the highest excursion made by the velocity pen on the records during the whole year. The head of the instrument is at a height of 10 metres above ground level.

LIST OF STATIONS APPEARING IN THE REPORT — SYNOPTIC AND CLIMATOLOGICAL STATIONS
YEAR 1972

District.	Station	Index number Illi	Latitude °N	Longitude °N	Elevation of the ground in metres (H or Ha)	Altitude of the station in metres (Hp)	Altitude of the baro- meter cistern in metres	Height of wind recording instruments (metres)		Synoptic observations								Hourly observations (H) Half hourly observ. (h) (0000-2400)	Upper air observations P (Pilot Balloon) W (Radio Wind) R (Radio Sonde)				Remarks
								Above building	Above ground	00	03	06	09	12	15	18	21		00	06	12	18	
Mediterranean	Sallum	62 300	31 33	25 11	4.0	6.0	5.2	10.0	14.0	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Mersa Matruh (A)	306	31 20	27 13	30.7	30.0	30.0	10.0	17.5	x	x	x	x	x	x	x	x	H	RW	W	RW	W	
	Alexandria . . (A)	318	31 12	29 57	—3.35	6.78	6.45	10.0	22.08	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Port Said . . . (A)	333	31 17	32 14	1.1	6.1	2.7	—	—	x	x	x	x	x	x	x	x	H	P	—	P	—	
	El Arish	338	31 07	33 45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ghazza	338	31 30	34 27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Lower Egypt	Tanta	348	30 47	31 00	7.31	14.85	12.51	10.0	12.0	x	x	x	x	x	x	x	x	H	—	—	—	—	
Cairo Area	Cairo (A)	366	30 08	31 24	111.54	74.5	64.72	—	10.0	x	x	x	x	x	x	x	x	h	—	—	—	—	
	Helwan	378	29 52	31 20	139.26	140.68	140.68	—	10.0	x	x	x	x	x	x	x	x	—	RW	W	RW	W	
Upper Egypt	Fayoum	381	29 18	30 51	23.43	—	—	10.0	13.8	—	—	x	x	x	x	x	—	H	—	—	—	—	
	Minya (A)	387	28 05	30 44	39.0	40.5	44.2	10.0	20.15	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Assyout (A)	393	27 11	31 06	71.08	69.6	69.6	15.0	20.0	x	x	x	x	x	x	x	x	H	—	—	—	—	
	Luxor (A)	405	25 40	32 42	95.0	88.45	88.45	10.0	21.0	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Aswan (A)	414	23 58	32 47	200.0	193.5	198.96	10.0	15.0	x	x	x	x	x	x	x	x	H	RW	W	RW	W	
Western Desert	Siwa	417	29 12	25 29	—15.0	—13.26	—13.26	10.0	14.6	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Bahariya	420	28 20	28 54	128.0	129.5	129.5	—	—	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Farafra	423	27 03	27 58	90.0	92.1	92.1	—	—	—	—	x	x	x	x	x	—	H	—	—	P	—	
	Dakhla	432	25 29	29 00	106.21	111.27	107.75	10.0	14.7	x	x	x	x	x	x	x	x	H	P	—	P	—	
	Kharga	435	25 27	30 32	77.79	72.75	78.68	10.2	14.2	x	x	x	x	x	x	x	x	H	P	—	P	—	
Red Sea	Tor	459	28 14	33 37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Hurghada	462	27 17	33 46	1.0	2.75	2.75	10.0	15.0	x	x	x	x	x	x	x	x	H	—	—	P	—	
	Quseir	465	26 08	34 18	8.7	10.83	10.0	10.0	14.4	x	x	x	x	x	x	x	x	H	—	—	—	—	

GENERAL SUMMARY OF WEATHER CONDITIONS FOR THE YEAR 1972

WEATHER

The prevailing weather in Winter was markedly cold intervened with few warm periods mainly in February. In spring weather was changeable, characterized with variant khamsin heat waves of short or moderate durations. In Summer stable weather prevailed : generally mild and humid in the northern parts, hot and rather humid in the middle parts, excessively hot and dry in the southern parts. In Autumn weather was rather changeable : generally mild intervened with heat waves in September and October and with few cold waves in November.

RAINFALL AND THUNDERSTORMS

Light to moderate rain fell over the northern parts during Winter and the transitions, and extended in few days to the middle parts.

Rain was heavy in few days over scattered parts in the north where it was associated with thunderstorms.

The monthly rainfall was generally above normal in March, April, November and December ; and was below normal in general otherwise.

The annual rainfall was generally above normal in north of the country till Cairo area, and was mostly below normal otherwise.

It is worthy to mention that the daily rainfall attained record values during March at Alexandria (15.6 mm.) on the 14th, Port Said (14.8 mm.) on the 20th, Cairo (Abbasiya) (5.4 mm.) on the 21st, Imbaba (8.6 mm.) on the 21st, Tahrir (16.7 mm.) on the 20th, Rosetta (20.2 mm.) on the 14th and at Ras-el-Hikma (21.7 mm.) on the 14th. The monthly rainfall attained record values during April at Salloum (34.2 mm.), Alexandria (35.7 mm.), Sidi Barrani (84.5 mm.), Ras-el-Teen (28.5 mm.) and at Sakha (36.6 mm.). The daily rainfall attained a record during August at Mersa Matruh (15.0 mm.) on the

23rd. During November the daily rainfall attained records at Tanta (17.3 mm.) on the 23rd, Shebin-el-Kom (44.0 mm.) on the 24th, Banha (27.3 mm.) on the 23rd, Giza (27.4 mm.) on the 24th, Fayoum (16.0 mm.) on the 24th and Farafra (15.2 mm.) on the 23rd ; and the monthly rainfall attained records at Rosetta (85.1 mm.), Balteam (70.2 mm.), Damanhour (37.1 mm.), Shebin-el-Kom (70.9 mm.), Banha (53.0 mm.), Cairo (20.8 mm.), Giza (47.5 mm.), Fayoum (21.0 mm.) and Farafra (15.2 mm.).

MISCELLANEOUS WEATHER PHENOMENA

The transits of depressions or troughs through the country were associated with scattered rising sand and in few days with local sandstorms.

The annual frequency of sandstorms was highest at Mersa Matruh where it was 18 days ; otherwise it ranged in general between 3 and 12 days.

Early morning mist and fog developed rather frequently in scattered parts in Delta and Cairo and with a less frequency in the Mediterranean and north of Upper Egypt till Minya area.

The annual frequency of fog was 14 days in both Alexandria and Cairo ; otherwise it ranged in general between 3 and 12 days.

SURFACE WIND

The prevailing winds were mostly light to moderate and blew from N to NW and with a less frequency from NE. Winds backed to fresh or strong W to SW in advance of the travelling depressions or troughs through the Country, and veered to W/NW in their rears.

Calm winds were rather frequent during late evening and early morning intervals in scattered places.

Gales were experienced during few days in few scattered localities mainly in the Red Sea district.

THE WEATHER DURING THE YEAR 1972

JANUARY

The prevailing weather this month was generally cold and humid with subnormal temperatures most of the month. Coldness was pronounced during night time particularly in the Western Desert & Middle Egypt, where minimum air temperatures approached or fell to 0°C in some nights. The month was intervened by few days of warm weather.

Light and subnormal rain fell over the northern parts in several days and extended to Cairo area on the 14th & 20th.

Early morning mist and fog developed frequently over scattered places in Delta, Cairo and northern parts of Upper Egypt districts.

Light rising sand blew in several occasions over few scattered localities mainly in Upper Egypt.

The prevailing surface winds in the northern parts of the country were generally light to moderate W/NW and occasionally SW ly in few days. In the southern parts of the Republic light to moderate Nly and NWly winds prevailed. Winds became fresh or strong during several days mainly in the Red Sea district.

Calms were frequent most of late night and early morning intervals in scattered land localities.

FEBRUARY

This month was intervened by two cold waves. The first wave was pronounced and prevailed from the 1st till the 11th and was associated with markedly low minimum temperatures mainly in the Western Desert & north of Upper Egypt district. The second cold wave was light and prevailed between the 16th & 19th. Otherwise warm weather was enjoyed.

Light rain was reported over the Mediterranean district during the cold waves and extended in few days to Lower Egypt & Cairo districts. Rain was heavy over scattered Mediterranean localities for few days.

Weather was light sandy during several days in few scattered localities mainly in the Red Sea & Upper Egypt districts.

Early morning mist developed in several occasions over scattered places in Delta, Cairo and north of Upper Egypt districts.

The prevailing surface winds over the northern parts of the Country were generally light to moderate N/NW and backed to W/SW during the cold waves. In the southern parts, light to moderate Nly winds prevailed.

Winds became fresh or strong during several days in few scattered localities mainly in the Red Sea district. On the other hand, calms were frequent most of night and early morning intervals in scattered localities.

MARCH

The prevailing weather in this month was changeable, characterized by five khamsin heat waves. The first four heat waves were light and were experienced round the 3rd, 7th, 11th & 18th. The last heat wave was the most pronounced and prevailed round the period (25th—28th). The break down of these heat waves was associated with appreciable fall in temperature and in particular the 3rd & 4th waves which were followed by cold weather round the periods (14th—16th) and (20th—24th).

The mean daily relative humidity was above normal most days of the month.

Weather was rainy in the period (13th—22nd) over the northern parts of the Country where the monthly rainfall exceeded the normal, otherwise rain was subnormal.

Rising sand was reported during several days over scattered places mainly in the Red Sea, Western Desert and Upper Egypt districts.

The prevailing surface winds this month were generally light to moderate W/NW in the northern parts of the Country and N to NW in the southern parts. Winds changed to SE/SW in few days in advance of the transitory depressions. Winds were occasionally fresh/strong during several days in scattered localities of the Republic.

APRIL

Weather in this month was markedly changeable. Four khamsin waves were experienced round the periods (6th, 7th), (12th—14th), (19th—21st), (25th—28th), the last of which was the most pronounced.

The transits of these khamsin waves were associated with rising sand and sandstorms which were most widespread during the last khamsin wave.

The break down of the khamsin disturbances was followed by mild periods with scattered rain over the northern parts, where the monthly rainfall was above normal and attained records at scattered localities. It is worth mentioning that exceptionally heavy rain associated with thunderstorms fell over Aswan area on the 28th.

Surface winds in this month were generally light to moderate NW and changed to fresh/storing W/SW by the transits of the khamsin depressions.

Gales were reported at Bahtim on the 29th & 30th, Cairo on the 29th, Suez on the 29th, Asyout on the 14th, Kom Ombo and Aswan on the 28th.

MAY

This month was intervened with three heat waves of short duration in the northern parts and moderate durations elsewhere with their peaks round the 4th, 7th and 19th. The first heat wave was most pronounced and yielded markedly high maximum air temperatures. Apart from these heat waves, mild weather was enjoyed.

Weather was mostly dusty in association with the first and second heat waves during the first third of the month particularly in the middle and southern parts of the Republic.

Light rain was reported during the first week over Lower Egypt and Cairo area districts where monthly rain was subnormal.

Light to moderate N and NW winds prevailed most of this month. Winds changed to SW in few days. Fresh to strong winds were experienced during several days in scattered localities mainly in the Red Sea, Upper Egypt & Western Desert districts.

Calms were frequent in night and early morning intervals in general.

Gales were recorded at Hurghada on the 5th.

JUNE

The prevailing weather during this month was generally mild & humid in the northern parts, rather hot & humid in the middle parts and hot and dry in the southern parts. The month was intervened with three variant heat waves attaining their peaks round the 7th 19th & 26th. The second heat wave was the most excessive and prevailed most of the third week. It is worthy to mention that weather was markedly mild most of the first half of the month over north of the country, yielding a record for the lowest maximum air temperature at Cairo (29.4°C) on the 1st.

The miscellaneous weather phenomena for this month were confined in light rain on the 8th over west of the Mediterranean coast and few scattered occasions of light rising sand.

The prevailing surface winds during this month were light to moderate N/NW. Winds freshened during several days in few scattered localities mainly in the Red Sea, Western Desert and Upper Egypt districts. Calm winds were frequent during night and early morning intervals in scattered places.

JULY

The prevailing weather this month was mild and humid in the northern parts, hot and humid in the middle parts, excessively hot and dry in the southern parts. The month was intervened with four short and light heat waves mainly pronounced in Upper Egypt area, with their peaks round the 3rd, 9th, 13th and 29th.

Early morning low clouds developed frequently over the northern parts with several days of mist over Delta, Canal, Cairo and north of Upper Egypt.

Light rising sand was reported during few days in few scattered localities in Upper Egypt, Western Desert and Red Sea districts.

Surface winds during this month were generally light to moderate and blew mostly from N and NW directions, and less frequently from N/NE directions in few scattered localities.

Winds became fresh to strong during some days in scattered places in the Western Desert and Red Sea districts. On the other hand, calm winds were frequent in scattered places in the late evening and early morning intervals.

AUGUST

The prevailing weather this month was generally mild & humid in the northern parts, hot & moderately humid in the middle parts, excessively hot & dry in the southern parts. The month was intervened by short mild periods.

The month was characterized in particular by abnormal rain over Mersa Matruh, Sidi Barrani and few land localities on the 23rd & 28th. It is worthy to mention that the daily rainfall reported a record (15.0 mm.) at Mersa Matruh on the 23rd.

Early morning low clouds developed frequently over Delta & Cairo, with scattered mist or fog during several days.

The prevailing winds during this month were generally light to moderate, and blew mostly from N & NW directions and less frequently from the NE direction. Winds freshened during few days in few scattered localities mainly in the Red Sea district. Calms were frequent in the evening and early morning intervals.

SEPTEMBER

The prevailing weather most of this month was mild & humid in the northern parts, rather hot & moderately humid in the middle parts, excessively hot & dry in the southern parts. The month was intervened with four variant heat waves with their peaks round the 5th, 10th, 18th & 29th. The last heat wave was the most pronounced. It prevailed from the 24th till the end of the month and was associated with markedly high temperatures and low humidity.

Early morning low clouds developed frequently over Delta & Cairo with several occasions of mist over scattered localities.

Light rising sand was reported in few days over scattered localities.

The prevailing winds during this month were generally light to moderate, and blew mostly from N to NW directions and less frequently from the NE direction.

Winds freshened during several days in few scattered localities mainly in the Red Sea and Western Desert districts. Calms were frequent in the evening and early morning intervals in general.

OCTOBER

This month started with mild weather which continued till the 4th. From the 5th till the 16th a prolonged heat wave was experienced. The break down of this heat wave was associated with scattered light rain over north of the country till Cairo area, and was followed by a mild period.

A second short heat wave was experienced in the period (22nd-24th) and was followed by mild weather which prevailed till the end of the month. This mild period was light rainy over the Mediterranean district, though heavy rain was reported locally over Sallum on the 24th (13.3 mm.) and over Sidi Barrani on the 23rd (30.2mm.).

Weather was sandy in few days over scattered localities in the Western Desert, Upper Egypt and Red Sea districts.

Early morning mist developed in few days over scattered places in Delta, Canal, Cairo and north of Upper Egypt.

Light to moderate N and NW winds prevailed most of this month and N/NE winds were experienced with a less frequency. Winds became fresh to string during several days in few scattered localities mainly in the Western Desert and Red Sea districts. On the other hand, calms were frequent most of night and early morning intervals.

Gales were reported at Farafra on the 24th, at Hurghada on the 27th & 28th.

NOVEMBER

The prevailing weather was generally mild day time, rather cool night time during the first three weeks, with scattered light rain mostly in the first week. Rain was locally heavy over the Mediterranean district on the 2nd and 9th.

A pronounced cold wave was experienced from the 23rd till the end of the month. This wave was characterized by heavy rain associated with thunderstorms and lightning on the 23rd and 24th over the northern parts, yielding monthly and daily rainfall records at several places.

Early morning mist developed during several days over scattered places in Delta, Cairo and north of Upper Egypt.

Light to moderate N and NW winds prevailed most of this month. Winds freshened during several days in scattered localities mainly in the Red Sea district. On the other hand calms were frequent most of night and early morning intervals in many land localities.

Cairo, December 1973

DECEMBER

The prevailing weather in this month was generally cold and humid. Coldness was severe in particular during the fourth week in the middle parts where the lowest minimum air temperature attained records at Imbaba (-1.5°C) on the 26th, Cairo (3.0°C) on the 27th, Minya (-0.8°C) on the 26th and Assyout (0.9°C) on the 25th.

Weather was rather rainy in the Mediterranean district during the first three weeks, where the monthly rainfall exceeded its normal values. Otherwise rain was deficient and subnormal.

Early morning mist and fog developed in several occasions over scattered places in Delta, Cairo and north of Upper Egypt.

Surface winds in this month were generally light to moderate and blew mostly from N to NE directions and in few days from W and NW directions. Winds freshened during several days in few scattered localities, mainly in the Red Sea district. On the other hand, calms were frequent during late evening and early morning intervals.

Chairman (M. F. TAHA)

Board of Directors

**TABLE A 1.—ANNUAL VALUES OF THE ATMOSPHERIC PRESSURE, AIR TEMPERATURE, RELATIVE HUMIDITY,
BRIGHT SUNSHINE DURATION & PICHE EVAPORATION**

YEAR 1972

STATION	Atmospheric Pressure (mbs) M.S.L		Air Temperature °C									Relative Humidity %		Bright Sunshine Duration (Hours)			Piche Evaporation mms. Mean
			Maximum		Minimum		A + B 2	Dry Bulb		Wet Bulb							
	Mean	D.F. Normal or Average	(A) Mean	D.F. Normal or Average	(B) Mean	D.F. Normal or Average		Mean	D.F. Normal or Average	Mean	D.F. Normal or Average	Mean	D.F. Normal or Average	Total Actual	Total Possible	%	
Sallum	1014.8	+0.2	25.0	—0.3	16.4	+0.8	20.7	20.4	0.0	15.7	—0.2	59	— 1	—	—	—	7.2
Mersa Matruh (A)	1015.0	+0.3	24.2	—0.1	15.3	+0.9	19.8	19.6	+0.3	16.1	—0.4	67	— 0	(3249.8)	(4413.3)	(74)	6.2
Alexandria . . (A)	1015.0	+0.9	25.0	0.0	15.8	0.0	20.4	20.0	—0.3	16.5	—0.3	68	— 1	3409.4	4455.8	77	5.5
Port Said . . (A)	1013.0	—0.2	25.4	+0.8	17.8	—0.7	21.6	21.1	0.0	17.1	—0.7	65	— 5	3438.7	4455.8	77	5.4
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Gharra	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tanta	1014.3	+0.4	26.9	—1.1	12.8	—0.2	19.8	19.2	—0.9	15.4	—0.4	65	+ 3	3535.8	4454.3	79	4.0
Cairo (A)	1014.2	+0.3	27.5	—0.6	15.9	—0.4	21.7	21.4	—0.1	15.9	—0.1	54	— 0	—	—	—	11.9
Fayoum	—	—	30.0	+0.5	14.1	—0.5	22.0	21.3	—0.6	15.8	+0.2	54	+ 5	—	—	—	6.7
Minya (A)	1013.3	0.0	29.6	—0.2	13.2	0.0	21.4	21.3	+0.1	14.9	—0.1	48	— 2	3817.6	4449.8	86	11.1
Assyout . . . (A)	1012.0	—0.9	30.1	—0.3	15.0	—0.4	22.6	22.4	—0.6	14.5	0.0	39	+ 2	—	—	—	13.8
Luxor (A)	1011.4	+0.2	33.7	+0.3	15.1	—0.5	24.4	24.3	—0.2	15.4	—0.2	36	+ 1	—	—	—	9.4
Aswan (A)	1011.2	+0.4	33.9	—0.3	17.9	+0.4	25.9	25.9	—0.2	14.3	—0.2	23	+ 3	—	—	—	20.9
Siwa	1014.6	0.0	29.6	—0.2	14.2	+1.1	21.9	21.9	+0.2	14.5	+0.4	42	+ 2	3492.6	4451.4	78	9.7
Bahariya	1014.3	+0.7	29.2	—0.4	14.1	+0.5	21.6	21.6	—0.4	13.7	—0.7	38	— 2	—	—	—	10.1
Farafra	1015.1	+0.1	30.2	+0.1	14.0	+0.5	22.1	21.9	—0.1	13.6	+0.7	36	+ 4	—	—	—	13.0
Dakhla	1014.0	+1.4	31.0	—0.4	13.5	—1.2	22.2	22.5	—0.4	12.9	—0.2	29	+ 1	—	—	—	16.9
Kharga	1012.8	0.0	32.2	0.0	16.5	+0.2	24.1	24.7	+0.7	13.8	—0.4	29	— 3	3938.2	4446.3	89	14.2
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hurghada	1011.6	+0.5	28.0	+0.7	18.3	+0.6	23.2	23.4	+0.2	17.0	+0.2	50	— 0	(3911.1)	(4436.1)	(88)	11.4
Quseir	1011.3	+0.2	27.6	—0.8	20.5	—0.2	24.0	24.2	—0.3	17.6	—0.2	50	+ 2	—	—	—	11.0

Note : Actual number of sunshine records was 365 at Mersa Matruh & 365 at Hurghada.

TABLE A2.— MAXIMUM AND MINIMUM AIR TEMPERATURE

YEAR 1972

Station	Maximum Temperature °C									Grass Min. Temp.		Minimum Temperature °C								
	Highest	Date	Lowest	Date	No. of Days with Max-Temp.					Mean	D. From Normal	Highest	Date	Lowest	Date	No. of Days with Min. Temp.				
					>25	>30	>35	>40	>45							<10	<5	<0	<-5	
Sallum	41.0	4/9	13.7	14/3	171	78	18	2	0	15.6	—	26.8	15/6	7.0	28/1.4/2	33	0	0	0	
Mersa Matruh . (A)	40.8	2/8	13.2	3/2.14/3	165	42	9	2	0	13.7	—	25.3	15/8	4.2	29/1	68	1	0	0	
Alexandria . . . (A)	39.8	29/9	13.6	3/2	181	69	11	0	0	13.8	—	25.0	31/7	4.2	15/2	71	1	0	0	
Port Said . . . (A)	36.4	19/6	14.1	7/2	190	109	2	0	0	17.3	—	25.8	17/9	7.5	7/2	21	0	0	0	
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Ghazza	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Tanta	39.2	18/6	14.3	14/3	216	148	18	0	0	—	—	21.7	2/8	1.2	20/2	125	28	0	0	
Cairo (A)	41.4	19/6	15.7	7/2	196	170	45	3	0	—	—	25.2	26/4	3.0	27/12	65	2	0	0	
Fayoum	42.8	19/6	17.2	29/11	244	184	112	13	0	10.4	—	24.8	4/8	1.5	26/12	109	33	0	0	
Minya (A)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Assyout (A)	43.6	4/5	16.7	25/12	248	194	122	22	0	12.1	—	26.5	28/4	0.9	25/12	106	23	0	0	
Luxor (A)	45.1	24/8	18.6	27/1	289	230	192	93	1	9.8	—	26.0	8/5,17/7, 1/10	1.2	29/1	104	40	0	—	
Aswan (A)	45.5	18/9	19.0	8/2	294	238	195	123	1	—	—	28.9	5/7	4.2	8/2	72	2	0	0	
Siwa	43.7	3/7	17.3	21/1	235	184	125	25	0	13.3	—	26.0	22/8	1.4	1/1	115	51	0	0	
Bahariya	43.1	3/8	17.1	24/12	230	187	105	12	0	13.5	—	24.9	4/8	—0.4	29/1	117	43	1	0	
Farafra	45.0	19/6	15.3	25/12	238	195	135	25	0	13.6	—	25.8	10/8	—0.6	9/2	116	59	1	0	
Dakhla	—	—	—	—	—	—	—	—	—	13.5	—	—	—	—	—	—	—	—	—	
Kharga	45.2	4/8	18.0	7/2	281	211	171	62	1	14.4	—	29.9	3/8	0.6	9/2	91	32	0	0	
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Hurghada	38.4	3/8	16.5	7/2	255	169	18	0	0	—	—	29.0	5/8	6.4	8/2	44	0	0	0	
Quseir	44.6	5/5	18.2	7/2	249	140	4	1	0	18.0	—	29.2	20/6	9.4	8/2	1	0	0	0	

TABLE A 3.—SKY COVER AND RAINFALL

YEAR 1972

Station	Mean Sky Cover (Oct)					Rainfall (mm)										
	00	06	12	18	Daily	Total Amount	Dev. From Normal	Max. Fall in one day		Number of days with Amount of Rain						
	U.T.	U.T.	U.T.	U.T.	Mean			Amount	Dte	<0.1	≥0.1	≥1.0	≥5.0	≥10	≥25	≥50
Sallum	2.1	2.0	3.0	2.1	2.2	119.5	+ 6.7	23.0	8 4	0	26	21	6	5	0	0
Mersa Matruh (A)	2.0	3.7	3.4	2.8	2.8	151.8	+ 8.3	23.7	9 12	9	49	26	8	5	0	0
Alexandria (A)	3.9	4.0	3.8	3.2	3.6	240.8	+47.9	35.3	2 11	7	49	33	14	8	1	0
Port Said (A)	1.6	2.3	1.8	1.6	1.6	111.3	+37.3	17.8	21 12	4	41	19	7	3	0	0
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ghazza	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tanta	1.0	2.2	3.0	2.1	1.9	52.9	+ 6.0	17.3	23/11	0	31	12	6	1	0	0
Cairo (A)	1.0	2.7	2.6	1.4	1.9	32.4	+ 7.6	17.8	23/11	5	19	7	1	1	0	0
Fayoum	—	1.3	2.1	1.2	—	21.0	+ 9.2	16.0	24/11	5	2	2	2	1	0	0
Minya (A)	0.5	1.1	1.6	0.9	1.0	2.8	— 1.7	2.8	21/3	6	1	1	0	0	0	0
Assyout (A)	0.4	0.7	0.9	0.6	0.6	1.0	+ 0.7	1.0	21/3	0	1	1	0	0	0	0
Luxor (A)	0.7	1.1	1.3	1.1	1.0	Tr.	— 1.1	Tr.	27/1,3/10	2	0	0	0	0	0	0
Aswan (A)	0.6	1.1	1.2	0.9	1.0	0.0	— 0.2	0.0	—	0	0	0	0	0	0	0
Siwa	1.7	1.5	2.6	1.8	1.9	11.2	+ 1.4	5.7	8/4	3	6	4	1	0	0	0
Bahariya	0.6	0.9	1.8	1.1	1.2	Tr.	— 4.1	Tr.	27/12	1	0	0	0	0	0	0
Farafra	—	0.6	1.1	0.7	—	15.2	+13.4	15.2	23/11	2	1	1	1	1	0	0
Dakhla	0.1	0.3	0.5	0.1	0.5	0.0	— 0.5	0.0	—	0	0	0	0	0	0	0
Kharga	0.4	0.8	1.0	0.5	0.7	0.0	— 1.1	0.0	—	0	0	0	0	0	0	0
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hurghada	0.5	1.2	1.4	0.9	1.0	1.3	— 2.0	1.3	28/4	2	1	1	0	0	0	0
Qusoir	0.4	1.3	1.5	0.9	1.0	1.3	— 1.6	1.2	28/4	1	2	1	0	0	0	0

Table A 4.—DAYS OF OCCURRENCE OF MISCELLANEOUS WEATHER PHENOMENA
YEAR — 1972

Station	Precipitation				Frost	Thunderstorm	Mist Vis \geq 1000 Metres	Fog Vis $<$ 1000 Metres	Haze Vis \geq 1000 Metres	Thick Haze Vis $<$ 1000 Metres	Dust or Sandrising Vis \geq 1000 Metres	Dust or Sandstorm Vis $<$ 1000 Metres	Gale	Clear Sky	Cloudy Sky
	Rain	Snow	Ice, Pellets	Hail											
Sallum	26	0	0	0	0	0	0	0	0	0	15	0	0	160	5
Mersa Matruh . . (A)	49	0	0	0	0	3	12	3	13	0	65	18	0	149	25
Alexandria (A)	49	0	0	0	0	9	24	14	10	0	8	4	0	75	31
Port Said (A)	41	0	0	0	0	2	1	0	3	0	9	1	0	236	3
El Arish	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ghazza	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tanta	31	0	0	0	0	0	85	3	6	0	5	0	0	226	7
Cairo (A)	19	0	0	0	0	2	127	14	102	3	56	7	1	203	4
Fayoum	2	0	0	0	0	2	0	0	5	0	6	0	0	—	—
Minya (A)	1	0	0	0	0	1	91	6	67	0	66	1	0	289	3
Assyout (A)	1	0	0	0	0	0	2	1	14	1	25	5	1	328	1
Luxor (A)	0	0	0	0	0	0	0	0	134	0	38	4	0	290	6
Aswan (A)	0	0	0	0	0	0	0	0	43	0	105	8	1	289	3
Siwa	6	0	0	0	0	1	0	0	3	0	40	2	0	218	15
Bahariya	0	0	0	0	0	0	2	0	0	0	14	1	0	279	4
Farafra	1	0	0	1	0	1	3	1	16	0	23	3	1	—	—
Dakhla	0	0	0	0	0	0	0	0	2	0	40	0	0	358	0
Kharga	0	0	0	0	0	0	0	0	3	0	58	1	0	322	3
Tor	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hurghada	1	0	0	0	0	1	0	0	13	0	73	5	3	297	9
Quseir	2	0	0	0	0	1	1	1	8	0	6	0	0	288	5

**Table A 5.—NUMBER IN HOURS OF OCCURRENCES OF CONCURRENT SURFACE
WIND SPEED AND DIRECTION RECORDED WITHIN SPECIFIED RANGES
YEAR 1972**

STATION	calm (hours)	Variable (hours)	Unrecorded (hours)	Wind speed in knots	Number in hours of occurrences of wind blowing from the ranges of directions indicated												
					345	015	045	075	105	135	165	195	225	255	285	315	All directions
					/	/	/	/	/	/	/	/	/	/	/	/	
					014	044	074	104	134	164	194	224	254	284	314	344	
Sallum	283	8	12	1-10	346	724	825	594	433	219	157	162	192	487	976	1348	6463
				11-27	48	144	81	43	34	20	9	59	198	294	525	561	2016
				28-47	0	0	0	0	0	0	0	0	0	1	1	0	2
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	394	868	906	637	467	239	166	221	390	782	1502	1909	8481
Mersa Matruh . . (A)	151	6	6	1-10	491	336	335	264	276	267	317	280	444	597	332	633	4475
				11-27	448	194	157	289	203	61	126	203	290	235	504	1383	4093
				28-47	0	0	0	4	5	0	3	14	12	7	8	0	53
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	939	530	392	557	484	328	446	497	746	839	844	2019	8621
Alexandria (A)	13	3	342	1-10	945	795	406	321	283	243	305	338	167	249	652	1293	5997
				11-27	293	245	83	68	21	8	18	81	156	173	500	723	2369
				28-47	0	1	1	0	0	0	0	4	4	0	0	0	10
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1238	1041	490	389	304	251	323	423	327	422	1152	2016	8376
Tanta (A)	323	3	29	1-10	1048	935	554	334	183	97	190	351	627	758	1201	1078	7356
				11-27	233	119	101	93	13	3	9	22	93	80	124	183	1073
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1281	1054	655	427	196	100	199	373	720	838	1325	1261	8429
Cairo	1118	17	652	1-10	740	878	581	312	100	81	164	213	202	342	485	717	4815
				11-27	346	619	252	115	61	39	72	100	122	143	100	203	2172
				28-47	0	0	0	0	0	0	0	6	4	0	0	0	10
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1086	1497	833	427	161	120	236	319	328	485	585	920	6997
Fayoum (A)	76	82	21	1-10	2641	2776	222	75	70	142	185	334	425	364	366	585	8185
				11-27	10	261	51	0	0	0	9	13	47	21	3	5	420
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	2651	3037	273	75	70	142	194	347	472	385	369	590	8605
Minya	52	7	39	1-10	3558	954	65	44	34	196	318	179	123	158	231	655	6515
				11-27	1387	415	5	0	1	5	34	12	11	73	100	128	2171
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	4945	1369	70	44	35	201	352	191	134	231	331	783	8686
Assyout (A)	257	7	31	1-10	711	273	86	70	131	151	136	49	100	1252	1898	1745	6602
				11-27	566	153	14	6	27	49	66	26	40	86	260	593	1886
				28-47	0	0	0	0	0	1	0	0	0	0	0	0	1
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1277	426	100	76	158	201	202	75	140	1338	2158	2338	8489

**Table A 5 (contd.)—NUMBER IN HOURS OF OCCURRENCES OF CONCURRENT SURFACE
WIND SPEED AND DIRECTION RECORDED WITHIN SPECIFIED RANGES**

YEAR 1972

Station	calm (hours)	variable (hours)	unrecorded (hours)	Wind speed in knots	Number in hours of occurrences of wind blowing from the range of direction indicated												
					345	015	045	075	105	135	165	195	225	255	285	315	All directions
					014	044	074	104	134	164	194	224	254	284	314	344	
Luxor (A)	414	0	9	1-10	880	741	344	296	205	262	1051	549	373	784	1211	1090	7786
				11-27	86	100	20	3	3	21	13	10	51	121	144	575	
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	
				All speeds	966	841	364	299	208	265	1072	562	383	835	1332	1234	8361
Aswan (A)	324	5	10	1-10	2002	1188	145	37	87	89	95	48	51	88	374	1505	5709
				11-27	676	476	20	5	3	13	13	8	11	55	322	1134	2736
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	2678	1664	165	42	90	102	108	56	62	143	696	2639	8445
Siwa	601	189	36	1-10	500	860	678	932	86	364	170	126	222	713	826	953	7210
				11-27	34	90	23	33	71	33	8	17	10	92	196	132	748
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	534	959	701	965	937	397	178	143	232	805	1022	1085	7958
Dakhla	237	201	161	1-10	893	540	234	281	189	214	285	276	401	725	1247	1811	7099
				11-27	365	209	11	0	2	4	16	10	12	22	105	330	1088
				28-47	0	0	0	0	0	0	0	0	0	0	0	0	0
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1258	749	245	281	191	218	301	286	416	747	1352	2141	8185
Kharga	80	49	43	1-10	2363	947	218	80	78	93	73	71	76	177	449	1334	5965
				11-27	1812	368	7	2	0	2	35	10	14	17	60	314	2641
				28-47	6	0	0	0	0	0	0	0	0	0	0	0	6
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	4181	1315	225	82	78	101	108	81	90	194	509	1648	8612
Hurghada	156	12	9	1-10	387	252	131	87	153	185	57	48	36	200	1207	429	3172
				11-27	1327	143	6	7	21	46	2	3	1	43	1498	2210	5307
				28-47	16	0	0	0	0	0	0	0	0	0	3	109	128
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	1730	395	137	94	174	231	59	51	37	243	2708	2748	8607
Quseir	88	18	351	1-10	1345	839	198	113	100	132	138	97	101	374	1045	1526	6008
				11-27	1266	480	12	0	0	10	5	0	1	6	49	483	2312
				28-47	7	0	0	0	0	0	0	0	0	0	0	0	7
				≥ 48	0	0	0	0	0	0	0	0	0	0	0	0	0
				All speeds	2618	1319	210	113	100	142	143	97	102	380	1094	2009	8327

UPPER AIR CLIMATOLOGICAL DATA

Table B 1. - MONTHLY MEANS, ABSOLUTE HIGHER AND LOWER VALUES OF ALTITUDE, AIR TEMPERATURE AND DEW POINT AT STANDARD AND SELECTED PRESSURE SURFACES

YEAR 1972

Station	Pressure Surface (Millibar)	Altitude of Pressure Surface (gpm)						Temperature (°C)						Dew Point (°C)	
		N	Mean	Highest		Lowest		N	Mean	Highest		Lowest		N	Mean
				Value	Month	Value	Month			Value	Month	Value	Month		
Helwan 0000 U.T.	Surface	357	998mb.	1010mb.	Jan.	980mb.	April	357	17.8	28.6	July	6.4	Dec.	357	11.2
	1000	177	145	220	Jan.	43	March	116	13.7	23.6	Oct.	6.5	Dec.	116	8.2
	850	355	1502	1700	Jan.	1371	April	353	13.0	26.0	8 p	3.3	Feb.	352	0.4
	700	355	3112	3215	Sept.	2945	March	373	4.6	15.8	July	10.5	Feb.	352	-10.1
	600	351	4351	4495	Oct.	4129	March	349	-3.4	9.1	July	-17.7	Mar.	337	-18.1
	500	349	5759	5939	Sept.	5552	March	338	-12.9	-0.2	July	-27.0	Mar.	348	-26.0
	400	345	7435	7612	July	7660	March	311	-24.8	-16.9	July	37.3	Jan.	341	-36.5
	300	339	9459	9802	July	9000	March	339	-39.6	-25.9	July	-59.5	Jan.	333	-50.1
	250	330	10994	11095	July	10276	Feb.	330	-47.9	-30.0	July	-57.7	Jan.	320	-56.6
	200	304	12138	12614	July	11727	Jan.	302	-51.8	-44.6	March Dec.	-67.6	Nov.	240	-63.4
	150	275	13939	14488	July	13533	Jan.	274	-61.9	-50.4	March	-70.3	Oct.	270	-61.1
	100	119	16474	16921	July	16059	Jan.	215	-64.6	-54.7	March	-77.8	Jan.	210	-67.8
	70	168	18515	19005	July	18219	Jan.	166	-66.6	-55.1	May	-84.8	June	160	-
	60	114	19569	20070	July	19183	Jan.	112	-64.3	-57.7	July	-69.7	Feb.	110	-
	50	112	20646	21083	July	20259	Jan.	112	-60.6	-53.4	July	-68.1	Feb.	110	-
	40	81	22118	22546	July	21710	Jan.	81	-58.0	-47.6	July	-66.5	Feb.	80	-
	20	79	23562	24133	July	23149	Jan.	79	-55.8	-45.9	July	-64.5	Feb.	70	-
	20	47	26451	27027	July	25837	March	47	-51.7	-40.4	July	-67.1	Mar.	40	-
	10	3	30000	31013	July	30093	Feb.	3	-48.0	-40.0	July	-61.5	Feb.	30	-

N = Number of cases the element has been observed during the year.

* The atmospheric pressure corrected to the elevation of the radiosonde station.

Note : Upper air data for Mersa Matruh and Aswan are not included since the observations of 0000 & 1200 U.T. for these stations were interrupted during the Year 1972

UPPER AIR CLIMATOLOGICAL DATA

TABLE B 1 (contd.)—ANNUAL MEANS AND ANNUAL ABSOLUTE HIGHER AND LOWER VALUES OF ALTITUDE, AIR TEMPERATURE AND DEW POINT AT STANDARD AND SELECTED PRESSURE SURFACES

YEAR 1972

Station	Pressure Surface (Millibar)	Altitude of Pressure Surface (gpm)						Temperature (°C)						Dew Point (°C)	
				Highest		Lowest				Highest		Lowest		N	Mean
		N	Mean	Value	Month	Value	Month	N	Mean	Value	Month	Value	Month		
Helwan 1200 U.T.	Surface	357	997m.b.	1010m.b.	Jan.	979m.b.	April	357	26.4	40.0	Aug.	13.4	Mar.	357	8.7
	1000	17	137	222	Jan.	69	Mar.	100	20.9	29.1	Oct.	11.1	Dec.	100	5.6
	850	347	1512	1583	Jan.	1391	Apr.	346	14.3	27.0	Aug.	— 0.6	Feb.	345	— 1.4
	700	339	3124	3241	Sept.	2951	Mar.	835	5.9	17.0	Sep.	—10.1	Nov.	333	—13.5
	600	238	4370	4517	Sept.	4125	Mar.	325	— 2.0	9.0	July	—18.9	Mar.	324	—20.2
	500	309	5786	5891	Sept.	5528	Jan.	307	—11.6	0.8	July	—25.8	Mar.	304	—28.9
	400	295	7470	7715	S. pt.	7064	Mar.	295	—23.3	— 9.5	July	—35.7	Feb.	289	—38.8
	300	282	9514	9842	July	9071	Mar.	281	—38.0	—24.4	July	—55.5	Feb.	278	—51.7
	250	276	10748	11136	July	10307	Mar.	275	—46.1	—34.0	July	—55.7	Feb.	269	—58.9
	200	266	12210	12654	July	11731	Feb.	265	—52.9	—43.0	Mar.	—65.5	Jan.	231	—64.2
	150	250	14939	14 27	July	13608	Feb.	250	—59.6	—50.1	Mar.	—68.0	May.	107	—68.9
	100	229	16 33	17017	July	16094	Jan.	227	—68.5	—58.8	Mar. Dec.	—77.1	June	—	—
	70	186	18698	19143	July	18303	Feb.	185	—64.4	—57.0	Nov.	—75.3	July	—	—
	60	147	19 66	20140	July	19190	Feb.	146	—62.1	—55.3	Nov	—68.2	Feb.	—	—
	50	146	20752	21235	July	20381	Feb.	145	—58.8	—53.0	Oct	—69.7	Nov.	—	—
	40	90	22240	22750	July	21670	Dec	89	—55.9	—48.6	May	—65.2	Nov.	—	—
	30	78	24059	24532	July	23579	Jan.	78	—51.2	—37.9	Nov.	—62.3	Jan.	—	—
	20	42	26737	27245	July	26184	Jan.	41	—46.3	—40.5	Apr.	—63.0	Jan.	—	—
	10	1	31329	—	—	—	—	1	—44.0	—	—	—	—	—	—

N = Number of cases the element has been observed during the year.

* The atmospheric pressure corrected to the elevation of the radiosonde station.

Note : Upper air data for Mersa Muth and Aswan are not included since the observations at 0000 & 1200 U.T. for these stations were interrupted during the year 1972.

**TABLE B 2.—MEAN AND EXTREME VALUES OF THE FREEZING LEVEL AND THE TROPOPAUSE ;
THE HIGHEST WIND SPEED IN THE UPPER AIR**

YEAR — 1972

Station	Freezing Level									First Tropopause									Highest wind speed			
	Mean			Highest			Lowest			Mean			Highest			Lowest			Altitude (gpm)	Pressure (mb.)	Direction (000—360)°	Speed in Knots
	Altitude (gpm)	Pressure (mb.)	Dew point (°C)	Altitude (gpm)	Pressure (mb.)	Dew Point (°C)	Altitude (gpm)	Pressure (mb.)	Dew Point (°C)	Altitude (gpm)	pressure (mb.)	Temperature (°C)	Altitude (gpm)	Pressure (mb.)	Temperature (°C)	Altitude (gpm)	Pressure (mb.)	Temperature (°C)				
0000 U.T.	(N)	(N)	(N)							(N)	(N)	(N)										
	M. Matruh	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Helwan	3770 (354)	651 (354)	-13.2 (351)	5807 (July)	502	-24.3	1390 (Feb)	860	-1.7	12812 (196)	191 (196)	-60.9 (196)	18240 (July)	78	-81.5	8290 (Feb)	340	-44.3	12590	—	285 162 Jan
	Aswan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1200 U.T.	(N)	(N)	(N)							(N)	(N)	(N)										
	M. Matruh	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Helwan	4007 (324)	635 (324)	-17.6 (321)	6 60 (July)	494	-20.8	1420 (Feb)	857	-5.9	13466 (192)	173 (192)	-61.7 (192)	18130 (July)	82	-74.5	6100 (Jan)	464	-28.4	13600	252	275 165 Apr
	Aswan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

N — The number of cases the element has been observed during the year.

Note : Upper air data for Mersa Matruh and Aswan are not included Since the observations of 0000 1200 U.T for these stations were interrupted during the year 1972.

**Table B 3. (Cont.) —NUMBER OF OCCURRENCES OF WIND DIRECTION WITHIN SPECIFIED RANGES AND
THE MEAN SCALAR WIND SPEED AT THE STANDARD AND SELECTED PRESSURE SURFACES
HELWAN — YEAR 1972**

Time	Pressure Surface (Millibar)	Wind between specified ranges of direction (000—360)*																								Number of Calm winds	Total Number of Observations (T N)	Mean Scalar wind Speed (Knots)
		345		015		045		075		105		135		165		195		225		255		285		315				
		/014		/044		/074		/104		/134		/164		/194		/224		/254		/284		/314		/344				
		N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m	N	(ff) m			
0000 U.T.	Surface	82	6	122	8	26	9	31	8	7	5	5	4	2	7	5	6	2	6	3	4	2	6	43	6	27	357	7
	1000	30	9	44	11	19	11	8	7	0	—	3	4	1	6	2	4	0	—	0	—	0	—	8	10	1	116	10
	850	69	12	69	14	31	14	7	9	5	9	4	9	7	15	14	10	19	14	36	15	44	16	49	15	1	355	14
	700	44	14	27	15	11	25	2	8	2	12	2	18	6	15	16	21	37	21	57	19	86	19	62	18	0	352	19
	600	28	16	16	16	3	5	1	5	0	—	2	26	4	40	14	20	43	29	95	25	85	22	55	20	0	346	23
	500	19	22	2	26	2	4	0	—	0	—	3	20	3	19	10	23	40	35	96	33	115	31	43	21	0	333	30
	400	14	25	1	24	3	11	0	—	1	3	1	53	3	18	9	22	55	41	105	40	94	36	34	21	0	320	39
	300	4	48	1	26	1	9	1	40	0	—	1	11	3	24	12	20	40	43	106	48	83	43	32	39	0	284	46
	250	4	31	1	44	1	9	0	—	0	—	0	—	6	13	13	32	50	43	89	52	81	48	14	43	0	259	49
	200	0	—	3	20	0	—	1	6	1	12	2	30	5	16	11	20	47	58	86	56	57	47	14	32	0	227	53
	150	0	—	1	4	0	—	0	—	2	18	1	25	10	24	18	31	30	50	66	59	36	46	5	36	0	169	52
	100	0	—	0	—	0	—	1	32	3	43	10	30	7	18	15	17	22	47	32	45	18	55	2	48	0	110	45
	70	0	—	2	10	1	23	7	24	20	19	8	20	6	11	3	54	5	21	10	38	11	45	0	—	0	73	32
	60	0	—	0	—	2	14	12	25	16	22	4	15	2	16	1	28	4	56	8	43	3	26	1	11	0	53	32
	50	0	—	0	—	2	18	12	19	11	21	3	18	2	6	0	—	3	30	6	33	1	27	0	—	0	40	25
40	0	—	0	—	3	28	19	22	6	21	1	6	0	—	0	—	3	29	2	56	2	32	1	22	0	37	29	
30	0	—	0	—	0	—	10	25	12	36	0	—	0	—	0	—	2	33	3	34	2	14	0	—	0	29	39	
20	0	—	0	—	0	—	7	31	3	22	0	—	0	—	0	—	0	—	1	24	0	—	0	—	0	11	28	
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
1200 U.T.	Surface	66	8	87	11	8	12	1	10	0	—	7	7	3	12	24	10	26	7	34	7	27	7	73	8	1	357	9
	1000	21	10	33	12	9	18	0	—	0	—	1	5	1	11	4	6	4	7	7	6	8	8	12	10	1	101	10
	850	54	11	64	12	37	12	22	10	4	10	3	8	12	11	11	9	22	14	40	14	36	10	41	12	1	347	12
	700	31	13	23	11	5	14	4	9	1	8	3	8	7	14	17	24	43	20	60	20	71	18	68	15	0	333	18
	600	18	18	11	13	2	5	2	12	1	7	3	18	6	15	14	20	40	32	84	25	88	22	50	20	0	319	23
	500	14	23	4	10	2	11	0	—	0	—	2	11	3	22	12	24	33	25	100	33	90	28	36	22	0	296	28
	400	6	36	0	—	3	8	0	—	0	—	1	6	3	21	8	32	33	36	104	40	88	36	24	28	0	270	36
	300	3	18	1	12	1	15	0	—	0	—	1	22	2	17	13	27	37	45	86	44	78	46	15	40	0	237	46
	250	1	59	2	13	1	20	0	—	1	6	0	—	0	—	12	39	32	51	88	57	70	45	12	44	0	219	52
	200	1	13	1	13	0	—	0	—	1	17	1	11	5	14	9	25	23	45	85	61	55	54	12	40	0	193	57
	150	1	20	0	—	1	3	0	—	1	10	2	12	9	20	12	33	27	43	61	59	44	65	6	47	0	164	58
	100	3	11	1	7	2	22	2	20	2	11	3	27	15	22	13	20	8	31	33	43	32	57	1	34	0	115	51
	70	0	—	1	15	2	10	2	28	14	28	16	24	4	28	6	36	6	24	17	37	14	43	2	18	0	84	32
	60	0	—	0	—	2	14	7	24	19	21	8	27	4	13	5	19	5	18	11	32	4	66	3	24	0	68	29
	50	0	—	0	—	2	35	9	22	16	21	10	22	1	33	3	15	6	23	4	38	2	34	3	33	0	56	26
40	0	—	1	34	2	22	5	26	17	16	5	24	2	18	3	17	2	18	3	26	1	15	1	10	0	42	22	
30	0	—	1	18	0	—	5	23	16	22	1	19	1	22	0	—	0	—	3	20	2	61	0	—	0	29	27	
20	0	—	0	—	0	—	2	20	6	20	0	—	0	—	0	—	2	12	2	21	0	—	0	—	0	12	23	
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

N = The number of cases the element has been observed during the year.

TN = The total number of cases the wind has been observed for all directions during the year.

Note : Upper air data for Mersa Matruh and Aswan are not included since the observations of 0000-1200 U.T. for these stations were interrupted during the year 1972.

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MERSA MATRUH — YEAR 1972

For the year as a whole the mean daily air temperature and relative humidity showed insignificant departures from the corresponding values of the year 1971. The total annual rainfall was 151.8 mm. against 143.5 mm. for normal.

Comparing the mean values of the agrometeorological elements in the months of the year with the corresponding values of the year 1971, we find the following :

The mean daily air temperature was higher than last year in April and from June to December inclusive ; and lower than last year in January, February, March and May.

The mean daily relative humidity was higher than last year in January, February and March ; lower in August, November and December ; and nearly the same as last year otherwise.

The total monthly rainfall was markedly higher than last year in January, March, August and December ; lower in November ; and showed slight departures from last year in other months of the year.

The mean daily actual sunshine duration was higher than last year in January, February and June ; lower in March, April, May and October ; and rather the same as last year otherwise.

The mean daily wind speed at 1.5 m. was lower than last year in January, February, April, June, July and December ; and showed slight departures from last year in the other months of the year

The highest maximum soil temperatures at depths between 2 and 100 cm. were generally higher than last year in March and August ; generally lower in January, February, May, November and December, and the departures were irregular in April, June, July, September and October.

The lowest minimum soil temperatures at depths between 2 and 100 cm. were generally higher than last year in April, July, September, October, November and December ; generally lower in January, February, May, June and August ; and the departures were irregular in March.

TAHRIR — YEAR 1972

For the year as a whole the mean daily air temperature was slightly below average and the mean daily relative humidity was slightly above average. The total annual rainfall was 68.6 mm. against 32.5 mm. for average.

The characteristic features of the year can be summarized in the following extreme mean values of elements acquired in the months of the year since the year 1961 :

- January** : the highest mean daily relative humidity.
- February** : the lowest mean minimum air temperature, the highest mean daily relative humidity
- March** : the highest mean daily relative humidity, the highest total monthly rainfall, the lowest mean pan evaporation and the lowest mean daily wind speed.
- April** : the highest mean minimum air temperature, the lowest mean actual sunshine duration.
- May** : the lowest mean actual sunshine duration, the lowest mean pan evaporation.

- June** : the lowest mean minimum air temperature, the lowest mean pan evaporation and the lowest mean daily wind speed.
- July** : the lowest mean pan evaporation and the lowest mean daily wind speed.
- August** : the lowest mean daily wind speed.
- September** : the highest mean maximum air temperature.
- November** : the highest total monthly rainfall and the lowest mean actual sunshine duration.
- December** : the lowest mean pan evaporation and the lowest mean daily wind speed.

Comparing the mean values of agrometeorological elements in the months of the year with corresponding average values, we find the following :

The mean daily air temperature was above average in April and September ; and below average in the other months of the year.

The mean daily relative humidity was markedly above average in January, February and March, the same as average in August and October ; and slightly above average otherwise.

The total monthly rainfall was above average in March, April and November ; below average in January, February and December ; and nearly the same as average otherwise.

The mean daily actual sunshine duration was above average in January, February, September and December, below average in March, April, May and November ; and nearly the same as average in June, July, August and October.

The mean daily pan evaporation was below average in all months of the year.

The mean daily wind speed was slightly below average in all months of the year, except in November when it was the same as average.

The highest maximum soil temperatures at depths between 2 and 100 cm. were generally higher than the corresponding values of last year in February and April ; generally lower than last year in January, March, May, September and December ; and the departures were irregular in June, July, August, October and November.

The lowest minimum soil temperatures at depths between 2 and 100 cm. were generally higher than the corresponding values of last year in April, June, July, August, September and October ; generally lower than last year in February, May, November and December ; and the departures were irregular in January and March.

BAHTIM — YEAR 1972

This year was rather normal as regards the mean daily air temperature and relative humidity. The total annual rainfall was 50.1 mm. against 33.0 mm. for normal.

The characteristic features of the year can be summarized in the following extreme mean values of elements acquired in the months of the year, since the station was operated in the year 1967 :

- January** : the lowest mean daily air temperature and the lowest mean minimum air temperature.
- February** : the highest mean actual sunshine duration.

- March** : the highest total monthly rainfall, the lowest mean pan evaporation, the lowest mean daily wind speed.
- April** : the highest mean daily air temperature, the highest mean minimum air temperature, the lowest mean actual sunshine duration.
- June** : the highest mean daily relative humidity, the lowest mean daily pan evaporation and the lowest mean daily wind speed.
- August** : the highest mean minimum air temperature and the highest mean daily pan evaporation.
- September** : the lowest mean daily relative humidity and the highest mean daily pan evaporation.
- November** : the lowest mean maximum air temperature, the highest mean daily relative humidity, the highest total monthly rainfall, the lowest mean actual sunshine duration and the lowest mean pan evaporation.
- December** : the highest mean actual sunshine duration.

Comparing the mean values of elements in the months of the year with the corresponding average values, we find the following :

The mean daily air temperature was above average in April, August, September and October ; and below average in the other months of the year.

The mean daily relative humidity was above average in January, November and December ; and showed small departures from average in the other months of the year.

The total monthly rainfall was above average in March, April and November ; below average in January, May and December ; and rather the same as average otherwise.

The mean daily actual sunshine duration was above average in January, February, December ; below average in March, April, May, November ; and rather the same as average in June to October inclusive.

The mean daily pan evaporation was above average in February, April, August, September, October ; and below average otherwise ; the departures from normal were generally slight.

The mean daily wind speed was below average in January, March, June ; and rather the same as average in the other months of the year.

The highest maximum soil temperatures at depths between 2 and 100 cm. were generally higher than the corresponding values of last year in April, June, October ; generally lower than last year in January, February, March, May, July, September, December ; and the departures were irregular in August and November.

The lowest minimum soil temperatures at depths between 2 and 100 cm. were generally higher than the corresponding values of last year in April, June, September, October ; generally lower than last year in January, February, May, August, November, December ; and the departures were irregular in March and July.

KHARGA — YEAR 1972

This year was rather normal as regards the mean daily air temperature and relative humidity. No rain was reported the whole year.

The characteristic features of the year can be summarized in the following extreme mean values of elements acquired in the months of the year since the station was operated in the year 1964 :

- January** : the lowest mean actual sunshine duration.
- February** : the lowest mean minimum air temperature, the highest mean actual sunshine duration.
- March** : the lowest mean actual sunshine duration, the lowest mean pan evaporation.
- April** : the highest mean daily air temperature, the highest mean minimum air temperature.
- August** : the highest mean daily air temperature, the highest mean minimum air temperature, the highest mean pan evaporation.
- November** : the highest mean daily relative humidity.

Comparing the mean values of elements in the months of the year with the corresponding average values, we find the following :

The mean daily air temperature was above average in January, April, May, August, September, October ; below average in February, November, December ; and was rather the same as average in March, June and July.

The mean daily relative humidity was above average in November and showed small departures from average in all other months of the year.

The mean daily actual sunshine duration was above average in February ; below average in January, March, September, October ; and rather the same as average otherwise.

The mean daily pan evaporation was above average in July to October inclusive and below average in other months of the year ; the departures from average were slight.

The mean daily wind speed was above average in August, October, November ; below average in April ; and showed insignificant departures from average in the rest months of the year.

The highest maximum soil temperatures at depths between 2 and 100 cm. were generally higher than the corresponding values of last year in March, April, July, August, October, November ; generally lower than last year in January, May, June, September, December ; and the departures were irregular in February.

The lowest minimum soil temperatures at depths between 2 and 100 cm. were generally higher than the corresponding values of last year in March, June, August, September to December inclusive ; generally lower than last year in January, February, May ; and the departures were irregular in April and July.

TABLE C 4.— EXTREME SOIL TEMPERATURE AT DIFFERENT DEPTHS IN DIFFERENT FIELDS (CMS)
YEAR 1972

Station	Highest (H) Lowest (L)	Dry field								Grass field							
		2	5	10	20	50	100	200	300	2	5	10	20	50	100	200	300
M. Matruh	H	44.4	41.1	36.2	32.6	30.0	27.3	25.8	—	—	—	—	—	—	—	—	—
	Date	2/8	21/8	2/8	2/8	24/8	25/8	20/10	—	—	—	—	—	—	—	—	—
	L	5.1	5.7	8.3	11.0	12.8	16.0	18.6	—	—	—	—	—	—	—	—	—
	Date	29/1	29/1	9/2	29/1, 9/2	9/2	31/1	1/2, 3/3	—	—	—	—	—	—	—	—	—
Tahrir	H	54.4	48.4	42.8	37.6	33.9	31.7	29.6	28.4	—	—	—	—	—	—	—	—
	Date	3/8	3/8	3/8	4/8	4/8	8, 20, 21/8	31/8, 2, 3/9*	12.18 & 24/9	—	—	—	—	—	—	—	—
	L	5.2	6.4	7.6	9.8	13.0	16.2	18.6	20.3	—	—	—	—	—	—	—	—
	Date	26/12	26/10	26/12	26/12	27/12	2, 10, 12/2	22, 23, 24/2	29/2, 6, 3/9*	—	—	—	—	—	—	—	—
Bahtim	H	55.9	47.2	40.7	35.3	32.3	30.6	28.3	26.9	—	—	—	—	—	—	—	—
	Date	19/6, 17/8	19/6	17/8	16/8	20, 21/8	31, 8	28, 29/9* 15/10*	9/11	—	—	—	—	—	—	—	—
	L	1.0	3.9	7.9	13.7	17.6	19.2	21.7	22.7	—	—	—	—	—	—	—	—
	Date	26/12	26/12	26/12	26, 27/12	2/2	19, 20, 21/2	14/5, 16/3	6/4	—	—	—	—	—	—	—	—
Kharga	H	59.7	52.0	44.4	39.0	36.0	33.6	3/4	30.4	—	—	—	—	—	—	—	—
	Date	4/8	4/8	4/8	5/8	6/8	28, 30/8 1/9*	23, 24/9 2/10*	23, 30/10, 7/11*	—	—	—	—	—	—	—	—
	L	3.4	5.5	11.0	15.8	19.4	22.0	24.6	26.3	—	—	—	—	—	—	—	—
	Date	9/2	27/12	27/12	7/2, 27/12	8/2	13, 14, 15/2	25, 26/2 7/3	11, 16, 17/4	—	—	—	—	—	—	—	—

* More than 3 days

**Table C1.—AIR TEMPERATURE AT 1½ METRES ABOVE GROUND
YEAR 1972**

STATION	Air Temperature (°C)					Mean Duration in hours of daily air temperature above the following values											
	Mean Max.	Mean Min.	Mean of the day	Night time mean	Day time mean	—5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	
M. Matruh	24.2	15.3	19.7	17.7	21.1	24.0	24.0	24.0	23.1	18.4	11.1	4.9	0.5	0.1	0.0	0.0	
Tahrir	28.5	13.2	20.0	16.4	22.9	24.0	24.0	23.8	21.5	17.7	11.8	5.9	2.6	0.3	0.0	0.0	
Bahtim	27.5	12.0	19.3	15.5	22.5	24.0	24.0	23.3	20.8	16.9	10.9	5.8	2.6	0.2	0.0	0.0	
Kharga	32.2	16.5	24.7	21.6	27.3	24.0	24.0	23.8	22.7	20.1	16.4	12.1	7.2	3.4	0.5	0.0	

**Table C 2.—EXTREME VALUES OF AIR TEMPERATURE AT 1½ METRES ABOVE GROUND,
ABSOLUTE MINIMUM AIR TEMPERATURE AT 5cms ABOVE GROUND OVER
DIFFERENT FIELDS.**

YEAR 1972

STATION	Max. Temp. at 1½ metres (°C)				Min. Temp. at 1½ metres (°C)				Min. Temp. at 5 cms. above (°C)			
	Highest		Lowest		Highest		Lowest		Dry soil		Grass	
	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date
M. Matruh	40.8	2/8	13.2	3/2,14/3	25.3	15/8	4.2	29/1	1.0	29/1	—	—
Tahrir	41.1	19/6	15.5	14/3	23.0	4/8	1.8	10.20/2	0.0	26/12	—	—
Bahtim	41.4	19/6	16.1	25/12	22.4	1/8	-1.2	26/12	-6.5	26/12	—	—
Kharga.	45.2	4/8	18.0	7/2	29.9	3/8	0.6	9/2	-1.2	28/1	—	—

**Table C 3.—(SOLAR+SKY) RADIATION, DURATION OF BRIGHT SUNSHINE, RELATIVE
HUMIDITY, VAPOUR PRESSURE AT 1½ METRES ABOVE GROUND, EVAPORATION
& RAINFALL**

YEAR 1972

STATION	(Solar+Sky) Radia- tion gm. cal/cm²	Duration of Bright Sunshine (hours)			Relative Humidity %				Vapour pressure (mm)						Evapora- tion (mm)		Rainfall (mm)		
		Total Actual monthly	Total Possible monthly	%	Mean of day	1200 U.T.	Lowest	Date	Mean of day	1200 U.T.	Highest	Date	Lowest	Date	Piche	Pan class A	Total Amou- nt Monthly	Max. Fall in one day	Date
M. Matruh . .	—	*	*	74	72	61	8	25/8 14/4	12.6	13.1	23.2	4/8, 29/9	2.1	25/4	6.1	—	151.8	23.7	9/12
Tahrir . . .	482.6	3547.9	4452.2	79	70	46	15	20/4	12.2	11.8	22.9	3/8	3.6	25/12	5.4	6.57	68.6	16.7	20/3
Bahtim. . . .	485.0	3451.1	4451.1	77	66	41	12	2/5	11.0	10.6	20.8	3/8	2.4	25/12	6.9	7.19	50.1	23.5	23/1
Kharga. . . .	484.9	3938.2	4446.3	89	32	21	5	23/2 19/6	6.9	6.7	16.0	8/9	1.5	23/8	14.4	14.56	0.0	0.0	—

* Total for 363 days

Table C 5.—SURFACE WIND

YEAR 1972

STATION	Wind Speed m/sec at 1½ metres			Days with surface wind speed at 10 metres							Max, Gust (knots) at 10 metres	
	Mean of the day	Night time mean	Day time mean	≥ 10 knts	≥ 15 knts	≥ 20 knts	≥ 25 knts	≥ 30 knts	≥ 35 knts	≥ 40 knts	Value (knots)	Date
. Matruh	4.0	3.0	4.9	336	325	192	91	28	14	4	54	29/4
Shir	1.9	2.5	1.4	348	185	50	12	5	3	0	47	2/5
Shim	2.1	1.2	2.9	304	150	39	11	6	0	0	45	7/4
Shiga	3.7	2.8	4.5	334	248	101	32	4	1	0	42	27/10

PRINTED IN ARAB REPUBLIC OF EGYPT
BY THE GENERAL ORGANIZATION
FOR GOVT. PRINTING OFFICES. CAIRO
First Under-Secretary of State
ALY SULTAN ALY
Chairman of the Board of Directors